

Activity-Based Costing (ABC) in Manufacturing Environment

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Abstract

Activity-based Costing (ABC) is a powerful tool for the an organization to have an accurate and effective cost for its product avoiding cost distortion that may lead sustainable development and growth which is mandatory to be competitive in the era of globalization and complex business environment. The article contains some brief description of international journals on ABC. Author has discussed some specific cases in different countries. Some of our journals highlight the impact of ABC on the European firms where as some other has tried to discuss the American context of ABC. Analysis contains some data on the Nestle Ltd., which maintains the ABC. Author focused on different era of business like service sector, technology business, manufacturing sector and many more. Implementing ABC in these different sectors is a little bit different. ABC has to be implemented considering the characteristics of that sector. In total ABC has been proved to be successful for almost all the sectors. Some other concepts have also been discussed here like theory of constraints, time driven ABC and many more.

Keywords: Activity Based Costing, Cost driver, Simulation model, Cost allocation

Introduction

Management accounting is well recognized as a tool to assist managers to make decisions, formulate plans and operate controls. Dynamic changes in business environment and vigorous global competition rectified some shortcomings of traditional management accounting system (MAS) in terms of validity, completeness, consistency, relevance and understanding creating a demand for modern management accounting tools such as Activity based Management, Activity based Costing, Activity based Budgeting, Benchmarking, Balance scorecard, Total Quality Management etc. Activity-based costing (ABC) was developed and has been advocated as a means of overcoming the systematic distortions of traditional cost accounting and for bringing relevance back to managerial accounting. A traditional system reports what money is spent on and by whom, but fails to report the cost of activities and processes (Miller 1996). Many organizations in the manufacturing industry have adopted the new costing method. Aranoff et al 1998) said that there are two purposes of activity-based costing. The first purpose is to prevent cost distortion. Cost distortion occurs because traditional costing combines all indirect costs into a single cost pool. Cost distortion is prevented in ABC by adopting multiple cost pools (activities) and cost drivers. The second purpose is to minimize waste or non-value-adding activities by providing a process view. Activity Based Costing is motivated by a belief that traditional (general ledger) accounting information is all but useless to managers who are interested in evaluating the effectiveness of resource allocation decisions in their companies. This traditional information is geared instead toward satisfying auditors or other outsiders who are interested in some evidence of financial accountability.

Review of Literature

For this article author analyzed related reputed studies and a trial is done to summarize the findings of those studies under specific head concerning the relationship between ABC & different recent issues such as Total Quality Management (TQM), Theory of Constrain (TOC), Activity Based Budgeting (ABB), Supply Chain Costing and the role of ABC as a business tool e.g. as a pricing tool, role in manufacturing concern, role in E-business, role in preparing financial budget etc.

Analysis of ABC & Theory of Constraints

According to **Robert Kee and Charles Schmidt (1997)**, traditional cost accounting system has two major alternatives – ABC and theory of constraints (TOC). Theory of constraints is suggested for long run. The paper has developed a general model between these two extreme approaches. Sometimes neither theory of constraints nor ABC may lead to an optimal product mix. This general model may be used to modify theory of constraints or ABC.

TQM as easy as ABC

According to **Steve R. Letza & Ken Gadd (1994)**, fundamental to TQM is the continuous improvement of business processes and activity based costing (ABC) is essentially an accounting system that measures the use of resources by activities. ABC therefore can generate the accounting information that is needed for TQM to evaluate costs.

Supply Chain Costing & Activity-Based Perspective

The purpose of the research paper “Supply Chain Costing: an Activity Based Perspective“ by **Binshan, Collins, Robert (2001)** is to help managers to improve their understanding of logistics costs and the accounting for those costs in order to optimize use of the total cost approach to managing logistics processes. This paper discusses the history and evolution of logistics management and ABC, the driving cost factors affecting the key logistics activities, and the use of ABC system to help improve the allocations of logistics costs to specific cost objects. It also includes managerial implications and implementation techniques for an ABC system.

ABC, A Powerful Tool for Pricing

In his journal, **John C Lere (2000)** told that ABC is a powerful tool for pricing than traditional costing system. The reason is under ABC, for each unit, batch or product level activity, a cost driver is identified which determines cost per unit. According to him, when the resource consumption for an order is typical of total expected company resource, both traditional cost system and ABC system estimates will be same. They will differ if orders are not typical of total expected company resource usage.

Strategic Cost Management: ABM Approach

Trussel & Biter (1998) describes the design and implementation of an ABM system which has two stages: first; resource costs are assigned to total activities and second; activity costs are assigned to cost objects. According to **Chen F. Frank (1996)**, a journey to cost-effective approach to advanced factory management through ABC approach can be as follows

Step 1: Identify / define factory activities

Step 2: Obliterate unnecessary activities as much as possible

Step 3: Identify cost driver for each activity

Step 4: Select necessary control/management functions to minimize/automate cost drivers

Step 5: Cost-effective advanced factory management system

Hughes Andrew (2005) mentioned in his study that ABC/ABM enables firms to focus on its activities and products; it traces cost-to-cost drivers. ABC information, by itself, does not invoke actions and decisions leading to improved profits and operating performance. Management must institute a conscious process of organizational change and implementation if the organization is to receive benefits from the improved insights resulting from an ABC analysis.

ABC for planning & decision-making

Kelline et al (1999) has done a research showing how ABC can be applied in the academic institution, i.e., colleges, universities. According to ABC approach, activities of the universities are categorized into four main parts- instruction (teaching), research, public service and administrative activity and thus costs related to these activities are allocated on the basis of time spent for each activity. **Sheu et al (2003)** is enclosed the traditional standard costing systems are irrelevant in most cases for management decisions because they are “too late to aggregated and too distorted”. Moreover, the measures fail to consider especially the presence of committed costs and related capacity limitations that lead to bottlenecks. Two alternative philosophies, TOC and ABC have been offered to overcome some of the failures of standard costing for improving managerial decision-making and provide more relevant information for evaluating the economic consequences of resource allocation decisions.

Application of ABC in Logistic Business

Stapleton et al (2004) said that how ABC can be used as a tool for determining true costs of marketing and logistics activities and help firms make better decisions based on more accurate costing information. **Thomas J. Goldsby & Darid J. Closs (2000)** in their research has found that

activity based costing (ABC) has become an analytical method of interest to many logistics organizations throughout the world.

Activity Based Life Cycle Costing

Emblemsvag Jan (2001) has introduced a new method for life cycle costing called activity based life cycle costing (LCC). The paper discusses Activity based life cycle assessment analysis method, which has several major advantages and then states the steps of implementing the activity based life span model.

Time Driven ABC

Kaplan et al (2003) enclosed since the traditional ABC model had many limitations, time driven activity based costing model was proposed which is simple and accurate. Time driven ABC is easy and fast to implement.

Objectives

- To develop a clear concept about the theoretical aspects of ABC
- To know the applications of ABC in different countries
- To know the problems and benefits of implementing ABC in any organization
- To find out the reasons of denying to implement ABC
- To know about the implementation of ABC in manufacturing sector
- To know about its benefits in public sector organizations
- To have knowledge about the relationship between ABC and other management accounting concepts such as Activity Based Budgeting, Theory of Constraints, Supply Chain Costing, Total Quality Management, Life Cycle Costing etc.

Methodology

For the purpose of preparing this report both primary and secondary data are used. Primary data have been collected by interviewing key personnel of Nestle Ltd. and the secondary data have been collected by logging on to website, studying different journal related to Activity-based Costing (ABC) and different books.

Implementation of Activity-based Costing in Manufacturing Environment

As the manufacturing environment moves to computer integrated manufacturing and the products that are manufactured are diverse, conventional cost systems can report seriously distorted product costs.

Joon Jong No and Brian H. Kleiner (1997) enclosed ABC systems achieve product costs that are more accurate than those reported by using multiple cost drivers to trace the costs of the activities of a manufacturing process to the products that consume the resources used in those activities. The objective an ABC system is to provide the most benefit possible at the lowest overall cost.

Mehmet and Jeanette said that traditional costing system has the inability to determine actual product / service costs accurately and the in ability to provide useful information to management for the purposes of making critical operating decisions. After implementing ABC one company can evaluate their customers and provides accurate cost data for price quotes.

Management may have the ability to rank overall customer value as well as their profitability on a per job basis. This information helps to target resource utilization, which may lead to an even greater customer value.

Based on their extensive case study based research on ABC implementation, **Innes and Mitchell (1991)** concluded that the change process involved in implementing ABC is an on-going one and that there are three factor types (motivators, facilitators and catalysts) which interact together to promote the cost accounting change.

Cohen et al (2005) have done a study on some Greek companies about whether they have implemented ABC costing or not. All the companies have been classified into four categories – adopters, supporters, deniers and unawares. The result of the specified journal can be summarized by the following:

ABC adopters (already implemented ABC) 40.9%
ABC deniers (don't want to implement ABC) 31.9%
ABC supporters (will implement ABC in future) 13.6%
ABC unawares (ignorant about ABC) 13.6%

ABC Implementation in Different Culture

Willi & Majidul (2004) has done a very significant task on ABC costing, entitled as, "US and German activity based costing: A critical comparison and system acceptability propositions". This article gives us an opportunity to know about the country-to-country variations in implementing accounting rules. As the ABC costing has taken place of traditional costing, it leads the further practice in this concern and country to country variations is the key point of different practice of ABC. Here the authors try to provide a comparison of the two systems by considering their specific development. They have found some areas of distinction like

- Different concept of cost
- Purpose of US and German ABC
- Difference in construction and cost allocation
- Quantity and quality of cost information and area of application

Supitcha & Fredrick (2007) did one study taking two countries ABC system as consideration: USA & Thailand. Thailand has adopted the ABC system of USA. In the real world it is a myth that successful accounting techniques in one country need to be modified for effective use in another country (Hofstede, 1984; Daley et al., 1985; Brington & Snodgrass, 1988; Frucot & Shearon, 1991; Harison, 1993). It finds that the resistance is high for a system that causes empowerment and redistribution of power. As the main argument is that cultural differences create obstacles for implementation of successful accounting technologies and practices, it needs to be modified

Gunasekaran, Marri and Y.Y. Yusuf (1999) did a research where they mentioned because of increased competition and complexity, traditional costing system is considered as inaccurate. ABC provides logical guidelines for managerial decision-making. Case experiences of this paper is about three Belgium companies and one Dutch company where two Belgium companies have proven to be successful in implementing ABC and others have proven to be failed. **5.0**

Implementation of ABC in Nestle

Nestle is the world's largest group, not only in terms its sales but also in terms of its product range and its geographical presence. Nestle covers nearly every field of nutrition, infant formula, milk products, chocolate and confectionery, instant coffee, ice-cream, culinary products, frozen readymade meals, mineral water etc. it is also a major producer of pet food. In most of this product groups and in most markets, Nestle is the leader or at least a strong member too. It is a much focused company, with 94% of the sales coming from the food and beverage sector. Nestle is present around the globe, on all continents, with around 230,000 people working in more in an 84 countries with 466 factories and with sales representatives in at least another 70 countries. Many of its brand names are familiar to all:

- Nestle Milk (1867)
- Nescafe (1938)
- Vittel (1960)
- Fristikles (1980)
- Maggie (1947)
- Thomy Alcon (1970)
- Nido
- Kit Kat etc.

Some of its products have broken records: 3000 cups of Nescafe are consumed every second and Kit Kat merited an entry in the Guinness Book of World Records as the world's bestselling chocolate bar with 418 KitKat fingers eaten every second around the world!

Nestle Ltd. introduced ABC in 1997. They used ABC costing as a supplement to the company's usual costing method. In case of implementation, their top management was a good initiator. They believe that the design and implementation of ABC is the responsibility of a cross-functional team rather than of the accounting department.

Training

The chief accountant of Nestle Ltd. was trained from China for 3 years. Experts were also come here and trained the employees. Their employees have taken the ABC system positively. After implementing their modern concept, Nestle Bangladesh Ltd. need more trained employees to maintain this system.

Activity-Based Costing (ABC) Work

The main ABC work is factory faced. In their head office, it is used for administrative work. They make interview the people who work in the department to identify major activities of that department. The trained employee collect information for assigning indirect costs to activity cost pools by interviewing the departmental manager. More data makes this process more complex. So they evaluate production cost center every 3 months and prepare the management report every month.

Decision

Top management takes their decision by comparing actual performance with budgeted estimation. To simplify the costing system top management used ABC software imported from India and Switzerland. It considers customer profitability analysis in case of ABC implementation .They think it is a good indicator of performance evaluation of the employees. For the implement of customer order processing activity, Nestle uses both Total Quality Management (TQM) and Process Reengineering. To eliminate waste and reducing delay and defects, they use Activity-based Management (ABM), Total Quality Management and benchmarking (a systemic approach to identify the activities for improvement).

Advantages of ABC System

The growing industrial complexity and product diversity have made the emergence of ABC system for growing firms. As a powerful tool for decision-making purpose, the major advantages of ABC systems are discussed below:

- ABC increased operational performance by allocating overhead costs based on the actual consumption of the resources by each activity.
- ABC recognizes the interdependencies of cost drivers to activities.
- It enables the management to see where the most important costs occur as well as what provides them.
- Decisions about improving pricing, marketing, product designing and product mix can be made more efficiently by implementing an ABC system.
- ABC system is the suitable method for correct and
- Redeploying a resource from a non value-added to a value-added activity
- By identifying the weak product lines and accurate costs, ABC helps to increase organizational efficiency and profitability
- Completely eliminating a non value-adding activity ABC can takeout costs
- Identifying and correcting an error that was not budgeted for correcting an error that was not budgeted for correction but would have caused an expense had it not been corrected
- Provide Growth by removing a bottleneck that was causing a capacity constraint
- It helps industrial marketers in three ways; it results in cost estimates to use in pricing, guides industrial marketers to adjust in negotiations to yield significant cost reductions and indicates areas for change in operations to permit cost reductions that will allow the company to satisfy customer wishes better.

Disadvantages of ABC

- ABC system is more costly to maintain than a traditional costing system.
- The implementation process of ABC system is very complex for managers to understand and it produces numerous data, activity measures and requires collecting, checking process etc.
- Because of complexity of the process, the decision-making process becomes lengthy.
- Resistances from the management as managers are accustomed to using traditional costing systems to run their operations.
- ABC data can easily be mis-interpreted as there are huge amount of irrelevant data.
- In practice, as managers insist on allocating all costs to costs objects, this results overstated cost and understated margin results mistakes in pricing.
- If no one in the organization looks at the new ABC cost and profitability information, the project team becomes disappointed.
- Consultants are not familiar with companies operation and problems. Hence, they failed to support management in some cases
- Resistance arises because people feel threatened by the suggestion that their work could be improved

Conclusion

Activity-based costing has already come up as a new generation concept in trade and commerce. It has changed the traditional view of cost and management accounting. It measures cost more accurately than other volume based cost system. As more accurate overhead cost allocations lead to fewer distortions, it acts as a performance evaluation tool. The system introduced some burning issues like ABM, balance scorecard, bench marking, TQM as performance evaluation tool. By using segment reporting and relevant costing in conjunction with ABC system unprofitable product line or department can be dropped.

When implementing an ABC system, a change in the management structure should occur in order to facilitate the application of ABC. It has become essential for capital-intensive production process. However, after analyzing conditions favoring the application of ABC, factors against implementation of ABC, timing of implementation a trade-off should occur between the economic benefits of an ABC and the costs of implementing it.

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